LESSON 4

MARINE AIR-GROUND TASK FORCE (MAGTF) C^4

At the same time, because war is characterized by disorder, uncertainty, and change, control in combat quickly breaks down. It is probably a mistake to speak of control in combat. As anyone who has survived combat will undoubtedly testify, it is one of the hardest of all human endeavors to control. In fact, it is impossible to control if by that we mean one man directing the actions of others.

-- FMFM 1-3
Tactics

Caesar had to do everything at one time: to raise the flag which was the signal for a general call to arms; to give the signal with the trumpet; to recall the soldiers from the trenchwork; to summon those who had gone a little farther to seek material for the rampart; to draw up a line of battle; to encourage the soldiers; and to give the signal for battle. A great part of these duties could not be done because of the shortness of time and the onrush of the enemy.

-- Gaius Julius Caesar
Caesar's Gallic Wars

We are out of money...so we must think.

-- Lieutenant General P. K. Van Riper

Introduction

Purpose

This lesson

- Defines and describes command, control, communications, and computers (C^4)
- Introduces the architecture and capabilities of the MEF C^4
- Explores how C^4 assets are employed by commanders to overcome some of the battlespace's uncertainty and to positively control their units
- Introduces some thought and points of view on current C^4, and where the Marine Corps will apply C^4 in the future

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Introduction, Continued

Why Study C^4

MAGTFs are expeditionary forces with global responsibilities; therefore, they need to be flexible, mobile, and responsive to accomplish their missions. As the preeminent warfighting organization in the Marine Corps, the MEFs have a full spectrum of C^2 assets available to fight and win on today's joint and multinational battlefield. An introduction to the architecture, capabilities, and vulnerabilities of the MEF C^4 systems will provide the framework for future professional development and study of these capabilities. By knowing the vulnerabilities as well, your planning capabilities will be enhanced by preparing around them.

As the Marine Corps' preeminent warfighting organization, the MEF must be able to integrate with joint and multinational forces. For all these reasons, the MEF has a full spectrum of C^4 assets available to fight and win on today's joint and multinational battlefield. This lesson will provide the framework for future professional development and study of these essential capabilities.

General Krulak's C^2 Point of View

General Charles C. Krulak's point of view on C^2 taken from the *Commandant's Planning Guidance* is quoted below:

We must reach and execute effective military decisions faster than our adversaries, in any conflict setting. Decision making that focuses on speed and creating tempo, mission control that focuses on low level initiative, simple planning processes and orders writing techniques that are measured by the quality of the intent, all require a command and control system that is both flexible and adaptable.

In looking at the command and control process, we will focus more on people than systems. Processes are what the commander does; systems exist only to support the commander's need. No matter how well we understand our warfighting concepts or how well we can perform tactical procedures, if we do not utilize the right command and control processes or build the right systems to support them, we are doomed to failure.

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Introduction, Continued

Relationship to Other Instruction	An understanding of the concepts of C^4 is necessary for you to function at the operational level of war. Understanding the basics of the MAGTF C^4 system principles, capabilities, and employment establish the foundation necessary to plan for the employment of Marine forces in *Warfighting From the Sea* (8804 through 8808) and *Operations Other Than War (OOTW)* (8809).
Study Time	This lesson, including the issues for consideration, will require about 3.5 hours of study.

Educational Objectives

Affects of C^4	Understand how the theory and nature of war affects C^4 systems and the application of such systems. [JPME 3(b)]
Relationships	Comprehend the relationship between decision-making processes and C^4 systems. [JPME 5(b)]
Concepts	Comprehend current and anticipated Marine Corps C^4 concepts. [JPME 5(c)]
Principles of Joint C^4 Systems	Identify the principles of joint C^4 systems. [JPME 2(a)]
Major MEF C^4 Systems	Comprehend the major C^4 systems of the MEF and how they are integrated with joint systems at the operational level of war. [JPME 5(c)]
PME Areas/ Objectives/Hours (accounting data)	2/a/1 3/b/.5 5/b/.5 5/c/.5

Historical Background

Early C^2

Commanders have always required methods to exert their will on the battlefield. To be effective, they have needed knowledge to know what was going on around them and some means of passing their commands on to their own units.

In classical and medieval times, when armies were relatively small, tactics were simple, and battlefields were compact. Commanders could often see all of the action with their own eyes and exercise position control without sophisticated C^2 methods. They could control their commands simply by telling this unit to move there and another to hold fast. Rudimentary C^2 methods such as gaudy uniforms, signal flags, fires, field music, couriers, pigeons, and smoke were effective. These methods represented C^2 on a very personal level.

More Recently

During the last two centuries, several historical forces worked to make C^2 far more complicated and difficult. Napoleon replaced small professional armies with the enormous conscript *grande armee* that sometimes numbered in the hundreds of thousands. The very size of these national armies made personal control by the commander impossible.

New weapons developed during the 19th century were far more lethal at ranges unheard of in previous wars. Long-ranged and rapid-firing weapons tended to spread the battlefield out, making C^2 very problematic. Various technological advances, such as the train and motor vehicles, made military forces more mobile and war more fast-paced. The battlefield became a larger, more complex, and an even deadlier arena.

Development of C^4 Need

As the need for more positive command, control, and communications developed, so did the organization and technology to meet the need. Technology began with the telegraph, which was widely used during the American Civil War, allowing instantaneous communications over hundreds of miles. The individual commander is assisted by a staff with officers responsible for specific functions.

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Historical Background, Continued

Advancement of Technology

Throughout world wars, field telephones and portable radios were employed. Since the end of World War II, there has been an explosion in communications and computer technology that has dramatically increased a commander's ability to control his force. Other electronic devices used are listed below:

- Radios are more capable and reliable.
- Satellites allow near instantaneous communication regardless of the terrain or location in the world.
- Computers are able to process amounts of information beyond the ability of any human being.
- Remote sensors and drone aircraft provide commanders with information about areas in their battlespace where they have no forces.

Technology has advanced so quickly and dramatically, military leaders have been hard-pressed to maximize its full potential. In contrast to the past when commanders had limited C^2 systems, now you will face a real danger of information overload, coupled with the ability to micromanage your subordinate units.

Today's MEF has an incredible array of technological and organizational tools to exercise the C^4 functions.

MAGTF C^4 Structure

The CE within the MAGTF is task-organized to fulfill the C^4 function. It is a unified command element with control of the ground, aviation, and combat service support elements. The CE's C^4 support is primarily task-organized from assets of the Surveillance Reconnaissance and Intelligence Group (SRIG). The SRIG provides strategic and operational-level interface into global, national, joint, and combined C^4 systems.

Discussion

Definitions

The following three definitions were taken from Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms,* which will help you in further reading:

- **Command** can be defined as authority and responsibility for using available resources effectively and planning the employment of organizing, coordinating, and controlling military forces for the accomplishment of assigned missions.

- **Control** can be defined as authority less than full command exercised by a commander over part of the activities of subordinate or other organizations.

- **Command and Control** can be defined as the exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission.

Coordination Needs

As integrated forces comprised of ground, air, and combat service support assets, MAGTFs need an exceptionally high degree of coordination between their ground combat, aviation combat, and combat service support assets to be effective. This is particularly true in such complex operations as amphibious assaults and maneuver warfare.

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Discussion, Continued

Importance of Effective C^2

The battlespace is an inherently chaotic place. You can expect

- The terrain to be unfamiliar and inhospitable
- The weather to be whatever you don't want it to be
- Your weapons and equipment to either break or fail to function
- Fixed-wing aircraft, helicopters, naval gunfire, and artillery ordinance to occupy the same airspace simultaneously
- Communications to be worse
- Friendly fire to be unfriendly
- Support from other units to be delayed or never show up
- Your mission to change and resources meant for you to be diverted
- Your enemy to be doing everything in their power to throw you off balance and destroy your forces

For a commander to have any hope of success, he must bring order to the battlefield. Effective C^2 provides commanders with the timely, complete, and accurate information they need to make informed command decisions and the ability to employ their forces accordingly.

Commander's Need

The desire to obtain current, complete, and accurate information on any situation in war is common to commanders and staff through the ages. Equally prevalent has been the quest for ever more efficient, effective, and speedy methods to translate decision into action. The quotations at the beginning of this lesson seem to indicate the desire to improve command, control, and intelligence activities may be doomed or futile.

Do you agree with this assessment? When you have finished your readings in this lessons, you should have a good idea of how you would answer that question and how to use your C^4 assets effectively and efficiently.

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Concepts of Command Systems

Command Systems

Command systems provide support to the commander and his staff. Specifically, they provide technical direction and control of weapon systems. The command systems' functions include

- Planning
- Directing
- Coordinating

Examples of Command Systems

Examples of command systems are

- Joint Force Headquarters
- Combat Operations Center, GCE
- Combat Operations Center, MEF
- Tactical Air Command Center, ACE
- Combat Operations Center/Rear Area Operations Center, CSSE

Elements of the MEF C^4 Systems

Elements of the MEF C^4 systems include

- Local Area Network/Wide Area Network (LAN/WAN)
- Tactical Combat Operations (TCO)
- Intelligence Analysis System (IAS)
- Position Location Reporting System (PLRS)/Global Positioning System (GPS)
- Contingency Tactical Air Planning Systems (CTAPS)/Marine Air Command and Control System (MACCS)

A discussion of each MEF C^4 element and what they provide to commanders and their staff commences below.

Local Area Network

The Local Area Network (LAN) provides

- Intrastaff coordination
- Information dissemination

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Concepts of Command Systems, Continued

Wide Area Network

The Wide Area Network (WAN) provides

- Intrastaff/commander connectivity
- Allows connection of separated LANs
- Supports C^4 systems information
- Support from the digital backbone

Tactical Combat Operations

The Tactical Combat Operations (TCO) provides

- Commander's automation capability to process battlefield information
- A common operating picture to commanders
- Enhanced situational awareness of the battlespace
- Core software: Joint Operational Tactical System (JOTS) (used by Navy/Coast Guard)
- Displays of air, ground, and maritime tracks worldwide
- Part of Joint Maritime Command System (JMCIS)

Intelligence Analysis Systems

The Intelligence Analysis Systems (IAS) is

- Echelon-tailored, all-source intelligence fusion system
- The hub of Marine Air-Ground Intelligence Systems (MAGIS)
- A sheltered, mobile system with multiple analyst workstations
- Client-server LAN configuration
- MSC suites configured in four workstations
- Single workstations for battalions/squadrons
- IAS links to national/theater/tactical levels

Position Location Reporting System

The Position Location Reporting System (PLRS) is

- An automated tactical navigation aid providing 3-D, near real-time position, navigation, and conflict avoidance information
- A supporter of fire support planning, C^2, and coordination
- Handles up to 370 users
- A family of terminals, including
- Master station
- Manpack
- Vehicle
- Airborne

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Concepts of Command Systems, Continued

Global Positioning System

The Global Positioning System (GPS)

- Operates as a worldwide, space-based, passive radio navigation system
- Provides absolute 3-D position, velocity, and reference time
- Accurate within 10 meters

Contingency Tactical Air Planning System

The Contingency Tactical Air Planning System (CTAPS)

- Developed by the Air Force as a joint system for Air Tasking Order (ATO) development and dissemination
- Contains several modules
- Air resources (aircraft, fuel, ordnance, crews)
- Intelligence/targeting
- ATO development
- Already on Navy carriers and amphibious command ships (LCCs)
- Currently in Marine Aircraft Wings (MAWs)

Marine Air Command and Control System

The Marine Air Command and Control System (MACCS) resides in the Marine Air Control and is comprised of

- Command system - TACC and supporting communications
- Control system - TAOC/DASC/ATC/LAAD/HAWK and supporting communications

Tactical Air Command Center

The Tactical Air Command Center (TACC) operates as the ACE commander's operational command post. The center

- Monitors current battle and directs the MACCS
- Plans for future battles and develops air tasking order (ATO) which is now Contingency Tasked Air Planning System (CTAPS) capable

A description of supporting communication systems commences on the following page.

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MEF C^4 Vulnerabilities

For the MEF to operate effectively, each of its elements must work in concert with one another. This demands comprehensive and reliable communications. Within the MEF, the communication assets include

- Digital backbone
- AN/TSC-85B
- AN/TTC-42
- WAN
- Limited Ultra-High Frequency (UHF) SATCOM
- Satellite access

Along with these capabilities comes vulnerabilities. If the communication systems fail, either through enemy action or internal faults, the operational effectiveness of the MEF will be seriously compromised.

Satellite Communication Limitations

Satellite Communication (SATCOM) limitations include

- Limited UHF SATCOM assets - all assets are in the Communication Battalion, none are in the wing or division
- Finite and limited, satellite channels available worldwide (proposed answer, worldwide fiber optic network [FON])
- Fiber optic cable network being established in every country
- Intercontinental cables
- Allowance of wide-band digital data/voice/video transmission
- Service can be interrupted/exploited by enemy

Joint C^4 System Interfaces

The Joint C^4 System interfaces are comprised of

- Intelligence Analysis Systems (IAS)
- Contingency Tactical Air Planning Systems (CTAPS)
- Joint Data Links (MACCS)
- Global Command and Control System (GCCS)

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Concepts of Command Systems, Continued

Global Command and Control System

The Global Command and Control System (GCCS)

- Replaces the Worldwide Military Command and Control System (WMCCS)
- Provides a flexible client-server architecture
- Moves information vertically and horizontally
- Includes 13 USMC candidate systems that were recommended to transition to GCCS Common Operating Environment

Required Readings

The Marine Air-Ground Task Force (MAGTF) Readings

Coakley, Thomas P. *Command and Control for War and Peace*. Introduction and pp. 3 to 16. Find this reading in the *The Marine Air-Ground Task Force (MAGTF) Readings*, Annex B, pp. B-3 to B-16. The introduction addresses some basic ideas of the importance of C^2 systems. The article gives you a broad view of C^2 and its critical importance and discusses the need to expand C^2.

MCDP-1, *Warfighting*

MCDP-1, *Warfighting*, pp. 77 to 81 and 84 to 86. Pages 77 to 81 discuss how commanders should implement command in garrison, therefore establishing implicit communication necessary for unity of effort, especially when put in an uncertain environment. Pages 84 to 86 include a perspective on effective decision making and the relationship of time in making those decisions.

MCDP-6, *Command and Control*

MCDP-6, *Command and Control*, pp. 35 to 43 and 118 to 121. Pages 35 to 43 discuss the importance of C^2 and propose command as the exercise of authority and control as the feedback on the effects of the action taken. Pages 118 to 121 address the management of information as it facilitates the rapid, distributed, and unconstrained flow of information in all directions.

Joint Pub Readings

- Joint Pub 6-0, *Doctrine for Command, Control, Communications, and Computers (C^4) Systems Support to Joint Operations*, chapter II, "C^4 Systems Principles," pp. II-1 to II-9 and chapter IV, "C^4 Systems Employment Responsibilities," pp. IV-9 to IV-12. Find this reading in the *Joint Pub Readings* Vol. III (8800), pp. 1141 to 1154.

- Chapter II guides you through C^4 systems and networks. It also introduces the C^4 principles.

- Chapter IV enlightens you with an overview of the Marine Corps communications organizations.

- Joint Pub 6-02, *Joint Doctrine for Employment of Operational/Tactical Command, Control, Communications, and Computer Systems*, chapter IV, "C^4 Systems and Support," pp. IV-3 to IV-11. Find this reading in the *Joint Pub Readings* Vol. III (8800), pp. 1155 to 1163. These pages cover the architecture of the Military Satellite Communications (MILSATCOM). They also cover various support systems of the joint forces.

For Further Study

References

The following references are **not** required. These references were used to address the topics presented in the lesson. They are included for your review as needed.

- Joint Pub 3-0, *Doctrine for Joint Operations.*
- MCRP 3-3.8, *Army and Marine Corps Integration in Joint Operations*.
- Van Creveld, Martin. *Command in War.* Cambridge, Massachusetts: Harvard University Press, 1985.

Issues for Consideration

Viewpoint	How does your view of the nature of war affect your view of C^4 Systems?
Purpose	What is the purpose of C^4 ?
Principles	What are the principles governing C^4 Systems?
Establishing C^4	A MEF will normally be expected to establish C^4 system connections to what organizations?
System Capabilities	What are the "backbone" communication system capabilities in the MEF? Are they flexible, mobile, survivable, and redundant?
Impact	What impact will the explosion in information systems, such as the Global C^2 System, the Marine Tactical Combat Operations, and Intelligence Analysis System have on the MEF C^4 architecture, especially in a joint and multinational environment?